

**WHAT IS CLAIMED IS:**

1. An isolated enzyme comprising an aminotransferase activity comprising the following properties:
  - (a) the enzyme has molecular weight of between about 43,000 Da and about 45,000 Da, or, has an isoelectric point of between about 5.0 and 5.4; and,
  - (b) the enzyme comprises an aminotransferase activity and exhibits higher aminotransferase activity when an aromatic amino acid is used as an amino group donor rather than when a non-aromatic amino acid is used as an amino group donor.
2. The isolated enzyme of claim 1, wherein the enzyme retains its aminotransferase activity at temperatures over about 90°C.
3. The isolated enzyme of claim 1, wherein the optimum aminotransferase activity is at a temperature of about 90°C.
4. The isolated enzyme of claim 1, wherein the enzyme has aminotransferase activity in conditions comprising a pH of between about pH 4 to about pH 11.
5. The isolated enzyme of claim 1, wherein the optimum aminotransferase activity is at a pH of about pH 6.
6. The isolated enzyme of claim 1, wherein the enzyme maintains its activity after exposure to treatment at about pH 6.5 and 95°C for about 6 hours.
7. The isolated enzyme of claim 1, wherein the enzyme remains stable at about pH 4 to about pH 11 and about 25 °C for 24 hours or more.
8. The isolated enzyme of claim 1, wherein the enzyme has a melting temperature at about pH 6.5 at about 120.1 °C where molar enthalpy change is about 2.4 x 103 KJ/mole.

9. The isolated enzyme of claim 1, wherein the enzyme has an  $\alpha$ -helix content of about 40% at about pH 6.5 and about 25 °C

10. The isolated enzyme of claim 1, wherein the enzyme has a molecular weight of about 44,000 Da.

11. The isolated enzyme of claim 1, wherein the enzyme has a homodimeric subunit structure.

12. The isolated enzyme of claim 1, wherein the enzyme has an isoelectric point of 5.2.

13. The isolated enzyme of claim 1, wherein denaturation of the enzyme is an irreversible process.

14. 12. The isolated enzyme of claim 1 comprising a sequence as set forth in SEQ ID NO:1.

15. An isolated enzyme comprising aminotransferase activity comprising the following properties:

(a) the enzyme has molecular weight of about 44,000 Da and an isoelectric point of 5.2;

(b) the enzyme exhibits higher aminotransferase activity when an aromatic amino acid is used as an amino group donor rather than when a non-aromatic amino acid is used as an amino group donor, and,

(c) the enzyme has an aminotransferase activity and retains its aminotransferase activity at temperatures over about 90°C.

16. An isolated polypeptide comprising an amino acid sequence as set forth in SEQ ID NO: 1.

17. An isolated polypeptide comprising an amino acid sequence derived from the amino acid sequence of SEQ ID NO: 1 further comprising a deletion, a substitution or an addition of one or more amino acid residues of SEQ ID NO: 1 and having an aminotransferase activity.

18. The isolated polypeptide of claim 16, wherein the substitution is a conservative substitution.

19. An isolated polypeptide comprising an amino acid sequence having at least 85% sequence identity to SEQ ID NO:1, and, the polypeptide has an aminotransferase activity.

20. The isolated polypeptide of claim 19, wherein the sequence identity to SEQ ID NO:1 is at least 90%.

21. The isolated polypeptide of claim 19, wherein the sequence identity to SEQ ID NO:1 is at least 95%.

22. The isolated polypeptide of claim 19, wherein the sequence identity to SEQ ID NO:1 is at least 98%.

23. The isolated polypeptide of claim 19, wherein the polypeptide has a sequence as set forth in SEQ ID NO:1.

24. An isolated nucleic acid, wherein the nucleic acid encodes a polypeptide as set forth in claim 19.

25. An isolated nucleic acid, wherein the nucleic acid encodes a polypeptide as set forth in SEQ ID NO:1.

26. An expression cassette comprising a nucleic acid comprising a sequence as set forth in claim 25.
27. A transformed cell comprising a heterologous nucleic acid, wherein the nucleic acid comprises a sequence as set forth in claim 24 or claim 25.
28. An array comprising oligonucleotide probes immobilized on a solid support comprising a nucleic acid as set forth in claim 24 or claim 25.
29. An array comprising polypeptides immobilized on a solid support comprising a polypeptide as set forth in claim 1 or claim 19.
30. An isolated antibody that selectively binds to a polypeptide as set forth in claim 1 or claim 19, or a polypeptide encoded by a nucleic acid as set forth in claim 24 or claim 25.
31. The antibody of claim 30, wherein the antibody is a monoclonal antibody.
32. A hybridoma cell line comprising an antibody as set forth in claim 31.
33. A method of making a transformed cell comprising a heterologous aminotransferase nucleic acid or polypeptide comprising introducing a nucleic acid as set forth in claim 24 or claim 25 into a cell, thereby producing a transformed cell.
34. A method of expressing a heterologous nucleic acid sequence in a cell comprising:
- (a) transforming the cell with a heterologous nucleic acid sequence comprising a nucleic acid as set forth in claim 24 or claim 25, wherein heterologous nucleic acid sequence comprises a promoter operably linked to the nucleic acid sequence; and

(b) growing the cell under conditions where the heterologous nucleic acid sequence is expressed in the cell.

35. A method of determining whether a test compound specifically binds to an aminotransferase enzyme comprising:

- 5 (a) expressing a nucleic acid as set forth in claim 24 or claim 25 under conditions permissive for translation of the nucleic acid to a polypeptide, or, providing a polypeptide as set forth in claim 1 or claim 19;
- (ii) contacting the polypeptide with the test compound; and
- (iii) determining whether the test compound specifically binds to the polypeptide.

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